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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,008	10/30/2003	Yiqing Liang	1617880-0010	7403

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WHITE & CASE LLP  
PATENT DEPARTMENT  
1155 AVENUE OF THE AMERICAS  
NEW YORK, NY 10036

EXAMINER
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TORRES, JOSE

ART UNIT	PAPER NUMBER
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2624

MAIL DATE	DELIVERY MODE
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10/30/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/698,008	Applicant(s) LIANG ET AL.	
	Examiner José M. Torres	Art Unit 2624	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 September 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 42-82 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 42-82 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/11/2007</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 11, 2007 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 42-45 and 48-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al. (US 2003/0100998).

As to claims 42, 57 and 75, Brunner disclose a method/computer-readable medium for characterizing animal behavior, comprising: segregating images of an animal from video images of the animal in a behavioral analysis apparatus ("Background Subtraction"), wherein the video images are taken from a top view (FIG. 15, "Top Camera **1502**", Paragraphs [0281] and [0295]); identifying at least one body

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part of the animal based on the images taken from a top view (Paragraph [0296]); identifying a center of mass of the animal based on the images taken from a top view (Paragraph [0296]); and characterizing/detecting behavior of the animal using the at least one body part and the center of mass of the animal (Paragraphs [0299] and [0302]).

However, as to claims 42, 57 and 75 the embodiment disclosed in Figures 15 and 16 also include a pair of side-view cameras **1605**. In Paragraph [0142] it is stated that the addition of a second camera is an option and that it may be provided to expand the angle of vision, and gain a measurement of depth. Also in Paragraph [0280] it is stated that the subject system is designed to be flexible. The information obtained from the top camera **1502** (Paragraph [0281]) includes all the information necessary to identify at least one body part and the center of mass (Paragraphs [0295] and [0296]).

Therefore, in view of Brunner et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Brunner et al.'s flexible subject system by implementing it using only one camera located at the top, as shown in Figures 15 and 16, in order to validate behavioral phenotypes associated with newly discovered genes and new drug leads (Paragraph [0005]).

As to claim 43, Brunner et al. further teaches wherein segregating images of an animal from video images includes subtracting a background image from a video image containing an image of an animal ("Background Subtraction", Paragraph [0295]).

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As to claims 44, 45, 58, 59, 76 and 77, Brunner et al. further teaches wherein characterizing behavior of the animal includes comparing a location of the at least one body part of the animal and a location of the center of mass of the animal to pre-trained behavior models/predefined rules (The positions of the anatomical features are compared to a set of decision rules. Paragraphs [0302] and [0303]).

As to claims 48-52, 70-74 and 78-82, Brunner et al. further teaches wherein the at least body part is a head, tail, waist, fore body, and hind body ("back of the animal, tail, extremities, shoulders, rump, base of tail", Paragraphs [0276] and [0296]).

As to claims 53 and 54, Brunner et al. further teaches, wherein the behavior analysis apparatus is an open field apparatus/a maze apparatus (FIG. 2, "Open Field ... Physical Challenge as an obstacle course or maze", Paragraphs [0147] and [0243]).

As to claims 55 and 56, Brunner et al. further teaches wherein the behavior analysis apparatus includes recognitions objects ("Moving an Object")/ a fear chamber ("Fear Conditioning", Paragraphs [0147] and [0261]).

As to claim 60, Brunner et al. further teaches wherein detecting behavioral events includes detecting a turning ratio of the animal by taking a ratio of a path length traveled over a number of turns, wherein a turn is counted when the animal makes a

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turn larger than ninety degrees when the animal travels one body length ("Drug-Induced Turning", Paragraph [0271]).

As to claim 61, Brunner et al. further teaches wherein detecting behavioral events includes detecting sniffing behavior of the animal by detecting when the animal's nose is in contact with a recognition object in the behavioral analysis apparatus ("Sniffing", Paragraph [0148]).

As to claim 62, Brunner et al. further teaches wherein detecting behavioral includes detecting stretch-and-attend by detecting the animal's approach to an object with fore body stretched and then lowered, followed by retraction of the fore body ("Stretch-Attend", Paragraph [0148]).

As to claim 63, Brunner et al. further teaches wherein detecting behavioral events includes detecting stay-across-areas by detecting the animal's partial incursion into a zone of the behavioral analysis apparatus (When the animal is being tested for olfactory cues, it partially perform an incursion on the baited holes (zones). Paragraph [0262]).

As to claim 64, Brunner et al. further teaches wherein detecting behavioral events includes detecting head dipping by detecting the animal's exploratory movement

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of its head over an edge of the behavior analysis apparatus (The head poking into a hole retrieving food performed by the animal is detected. Paragraph [0262]).

As to claim 65, Brunner et al. further teaches wherein detecting behavioral events includes detecting freezing by detecting an absence of movement of the animal's body for a period of time ("Freezing", Paragraph [0148]).

As to claim 66, Brunner et al. further teaches wherein detecting behavioral events includes detecting locomoting by detecting movement of the animal within the behavioral analysis apparatus ("Locomotion", Paragraph [0148]).

As to claim 67, Brunner et al. further teaches wherein detecting behavioral events includes detecting transgressing behavior by detecting movement of the animal from a defined zone within the behavioral analysis apparatus to another defined zone within the behavioral analysis apparatus ("Straight Alley", Paragraph [0271]).

As to claim 68, Brunner et al. further teaches wherein detecting behavioral events includes calculating a proximity score by determining a distance of the animal from a goal at predetermined time intervals ("Straight Alley", Paragraph [0271]).

As to claim 69, Brunner et al. further teaches wherein detecting behavioral events includes determining heading errors by detecting when the animal is moving away from a goal ("Orientation, Direction of Turning", Paragraph [0271]).

4. Claims 46 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner et al. in view of Gondhalekar et al. (U.S. Pat. No. 6,837,184). The teachings of Brunner et al. have been discussed above.

As to claims 46 and 47, Brunner et al. does not explicitly disclose wherein characterizing the behavior of the animal includes determining the location of the at least one body part/center of mass of the animal in relation to a user-defined virtual zone.

Gondhalekar et al. teaches a Programmable Electronic Maze for Use in the Assessment of Animal Behavior, which comprises a programmable floor capable of constructing various obstacles and passageways. The programmable floor ("User-Define Virtual Zone") may be programmed by a human user (See Abstract, Col. 2 line 45 through Col. 3 line 46 and Col. 4 lines 16-61).

Therefore, in view of Gondhalekar et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Brunner et al.'s flexible subject system by incorporating the user programmable maze to create virtual zones, as taught by Gondhalekar et al., and locating the at least one body part/center mass within the maze, as taught by Brunner et al., in order to gain insight into the effect



of a drug on the behavior of the animal with a number of different mazes without transferring the animal from one maze to another (Col. 1 lines 22-45).

### ***Response to Arguments***

#### **Information Disclosure Statement**

5. The non-patent literature documents identified by Applicants in their Information Disclosure Statement (IDS) have been considered. See attached IDS.

#### **Claim Rejections under 35 U.S.C. § 102**

6. Applicant's arguments with respect to claims 42-82 have been fully considered but they are not persuasive.

With respect to amended independent claims 42, 57, and 75 Applicant alleges that while it is true that Brunner et al. discloses a top camera 1502, the animal habitat shown in Figures 15 and 16 also include two side-view cameras 1605 (See Page 10 of Amendment After Final filed on September 11, 2007). Examiner agrees. In addition, Applicant also alleges that the limitation "the video images are taken only from a top view", of independent claims 42, 57 and 75 is not found in Brunner et al. However, in view of the instant rejection (See ***Claim Rejections - 35 U.S.C. § 103*** Section above) it is shown that the embodiments disclosed in Brunner et al. include a flexible subject system wherein a single camera can be used.

Firstly, as disclosed in Paragraph [0242], the embodiment of Figures 1 and 2 is discussed, and as stated, "Optionally, a second camera may be provided to expand the

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angle of vision, and gain a measurement of depth", therefore, it is anticipated that the use of only one camera is used in the system. However, the position of the current video camera **10** does not correspond to a top view (See Paragraph [0245]).

Secondly, in Paragraph [0280] wherein the embodiment of Figures 15 and 16 is discussed, it is stated, "the subject systems are designed to be flexible". In addition, in Paragraph [0281] a top camera **1502** is provided to locate the animal on the floor **1504** of the cage, it provides X-Y coordinates of the animal, it can also be used to determine certain body shapes, and it also provides information concerning the rate and direction of travel of the animal, which may be useful in identifying behavior. "In certain optional embodiments, the top camera **1502** is also used to determine which of the side-view cameras **1605** to use to view the animal in profile". Therefore, the use of the side cameras is merely provided as an option.

Applicant also alleges that images from all of the cameras is used to create the 2D modeling to identify the animal parts (See Pages 10 and 11 of Amendment After Final). However, in view of the arguments presented above, the use of side-view cameras is merely an option. Therefore, when only the top camera is utilized the Image Segmentation Module **1424** and the 2D Model Fitting **1426** can be successfully performed (Paragraphs [0295] and [0296]), since the information used to perform these operation consists of "a video image". This "video image" is subjected to image processing by the Image Segmentation Module **1424** and the data from the Images Segmentation Module **1424** is then subjected to 2D Model Fitting **1426**.

Since in at least Paragraphs [0242], [0245], [0280] and [0281] a single camera, and the position of such being at the top of the cage is disclosed, it would be obvious, in view of Brunner et al., to one of ordinary skill in the art at the time the invention was made to modify the flexible subject system by using only one camera located on the top, as shown in Figures 15 and 16, in order to (Paragraph [0005]).

With respect to claims 46 and 47, Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

With respect to claims 43-45, 48-56, 58-74 and 76-82, Applicant's arguments are no different from those previously presented with respect to claims 46, 57 and 75. Therefore, they are not persuasive.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Tsuchikawa et al. disclose a Method and Apparatus for Moving Object Extraction Based on Background Subtraction, and Mori et al. disclose an Animal Body Identifying Device and Body Identifying System.

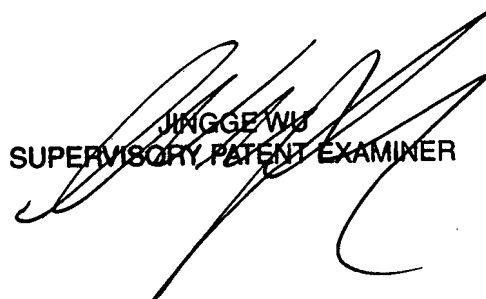
Any inquiry concerning this communication or earlier communications from the examiner should be directed to José M. Torres whose telephone number is 571-270-1356. The examiner can normally be reached on Monday thru Friday: 8:00am - 4:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR: Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMT  
10/25/2007

  
JINGGE WU  
SUPERVISORY PATENT EXAMINER